

IN THE CLAIMS

Please replace the presently pending claims with the following amended claims:

1. (Currently Amended) Method for reception of a signal modulated according to a main constellation, called ~~the~~ a main signal, and at least one signal modulated according to a secondary constellation, called ~~the~~ a secondary signal, said secondary constellation being included in said main constellation, said method comprising:

~~a demodulation step of~~demodulating said main signal, outputting a confidence bit for each of the elements in the main constellation, related to reception of said element, called ~~the~~ a main confidence bit,

~~characterised in that it comprises a step to determine~~determining at least one confidence bit related to reception of at least one element of said secondary constellation, called a secondary confidence bit, using at least one of said main confidence bits, so as to demodulate the secondary signal.

2. (Currently Amended) Reception method set forth in claim 1, ~~characterised in that~~ wherein said element is one of the bits transmitted by a symbol of said main and / or secondary constellation.

3. (Currently Amended) Reception method set forth in claim 2, ~~characterised in that~~ wherein said main confidence bit is a hard reception decision of said bit in said main signal.

4. (Currently Amended) Reception method set forth in claim 3, ~~characterised in that~~ wherein it comprises a prior step to determine the log likelihood ratio (LLR) of said bit called "soft bit", for at least some of said bits of said main signal, using said associated hard decision.

5. (Currently Amended) Reception method set forth in claim 4, ~~characterised in that~~ wherein said prior determination step uses a criterion belonging to the group comprising:

- ~~the~~ a Lop-Map criterion;
- ~~the~~ a Max-Log-Map criterion;
- ~~the~~ a SOVA (Soft-Output Viterbi Algorithm based on the maximum likelihood criterion

for detection of the most probable sequence),
and / or an approximation of one of these criteria.

6. (Currently Amended) Reception method set forth in claim 2, ~~characterised in that~~wherein said main and/or secondary confidence bit associated with a bit is a log likelihood ratio (LLR) of said bit, called the main and / or secondary soft bit.

7. (Currently Amended) Reception method set forth in claim 6, ~~characterised in that~~wherein said step to ~~determine~~of determining said secondary confidence bit comprises the following sub-steps:

- said secondary "soft bits" are expressed as a function of a posteriori probabilities of symbols in said secondary constellation, said symbols in said secondary constellation also belonging to said main constellation, so as to obtain a first expression;
- the a posteriori probabilities of bits in said main constellation are expressed as a function of the a posteriori probabilities of symbols in said main constellation, bringing out the soft bits of said main constellation, output during said demodulation step of said main signal so as to obtain a second expression.

8. (Currently Amended) Reception method set forth in claim 7, ~~characterised in that~~wherein it also comprises a sub-step ~~for mathematical simplification of~~ mathematically simplifying said first expression, using a saturated linear approximation or a piecewise linear approximation.

9. (Currently Amended) Reception method set forth in ~~any of claims 7 and 8,~~ ~~characterised in that~~claim 7 wherein it also comprises a sub-step to classify symbols in said main constellation so as to minimise the number of soft bits in said main constellation used during the calculation of soft bits in said secondary constellation.

10. (Currently Amended) Reception method set forth in claim 1, ~~characterised in that~~wherein the element is a symbol in said main and / or secondary constellation.

11. (Currently Amended) Reception method set forth in claim 10, ~~characterised in that~~wherein said main and/or secondary confidence bit associated with a symbol is an a posteriori probability of a symbol in said main and/or secondary constellation.

12. (Currently Amended) Reception method set forth in claim 11, ~~characterised in that~~wherein during said ~~demodulation~~ step of demodulating said main signal, said main confidence bits are ~~preferably~~ calculated using one of the detection algorithms belonging to the group comprising:

- ~~the a~~ Max-Log-Map;
- ~~the a~~ Log-Map;
- SOVA (Soft-Output Viterbi Algorithm based on the maximum likelihood criterion for detection of the most probable sequence);
- DDFSE (Delayed Decision Feedback Sequence Estimation);
- RSSE (Reduced-State Sequence Estimation);
- M-algorithm;
- T-algorithm.

13. (Currently Amended) Reception method set forth in claim 12, ~~characterised in that~~wherein said detection algorithm being two-directional, said secondary confidence bits associated with the symbols in said secondary constellation are secondary soft bits corresponding to the log likelihood ratio (LLR) values of said bits of said symbols, and are determined by the following sub-steps:

- selecting a sub-set of a posteriori probabilities of symbols in said secondary constellation among the set of a posteriori probabilities of available symbols in said main constellation;
- ~~determined~~determining said secondary soft bits as a function of said sub-set of a posteriori probabilities of symbols in said secondary constellation, said symbols in said secondary constellation also belonging to said main constellation.

14. (Currently Amended) Reception method set forth in claim 13, ~~characterised in that~~wherein said ~~prior determination~~ sub-step of determining uses a criterion belonging to the following group:

- the Log-Map criterion;
- the Max-Log-Map criterion;
- SOVA (Soft-Output Viterbi Algorithm based on the maximum likelihood criterion for detection of the most probable sequence),
and / or approximation of one of these criteria.

15. (Currently Amended) Reception method set forth in claim 12, ~~characterised in that~~wherein since said detection algorithm is single-directional, said secondary confidence bits associated with symbols in said secondary constellation are secondary soft bits corresponding to the log likelihood ratio (LLR) values of said bits of said symbols, and are determined by the following sub-steps:

- selecting a sub-set of a posteriori probabilities of symbols in said secondary constellation among the set of a posteriori probabilities of available symbols in said main constellation;
- ~~determine~~ determining said secondary soft bits as a function of the sub-set of a posteriori probabilities of symbols in said secondary constellation, said symbols in said secondary constellation also belonging to said main constellation;
- ~~determine~~ determining the sign of secondary soft bits as a function of the value of bits of symbols in said main constellation.

16. (Currently Amended) Reception method as claimed in ~~any of claims 1 to 15, characterised in that~~ claim 1, wherein said main and / or secondary constellations belong to the group comprising:

- M-QAM modulations, where $M = 2m$;
- N-PSK modulations, where $N = 2n$;
- ~~the~~ a linearised GMSK or MSK modulation.

17. (Currently Amended) Receiver of a modulated signal according to a main constellation, called ~~the~~ a main signal, and at least one modulated signal according to a secondary constellation, called ~~the~~ a secondary signal, said secondary constellation being included in said main constellation, said receiver comprising:

~~means of demodulating~~ a demodulator, which demodulates said main signal outputting a

confidence bit related to reception of each element in the main constellation, called ~~the~~ a main confidence bit, ~~and characterised in that it comprises means of~~ determining at least one confidence bit related to reception of at least one element in said secondary constellation, called ~~the~~ a secondary confidence bit, using at least one of said main confidence bits, so as to demodulate the secondary signal.

18. (Currently Amended) Receiver set forth in claim 17, ~~characterised in that~~wherein this receiver is of the type belonging to the group comprising:

- GSM receivers;
- GPRS receivers;
- EDGE receivers.

19. (Currently Amended) Receiver set forth in ~~either of claims 17 and 18, characterised in that~~claim 17, wherein said element is one of the bits transmitted by a symbol in said main and / or secondary constellation.

20. (Currently Amended) Receiver set forth in claim 19, ~~characterised in that~~wherein said main confidence bit ~~is~~ comprises a hard decision for reception of said bit in said main signal, and ~~in that it comprises prior means to~~ wherein the demodulator determines the log likelihood ratio (LLR) of said bit called a "soft bit", for at least some of said bits of said main signal, using said associated hard decision.

21. (Currently Amended) Receiver set forth in claim 20, ~~characterised in that~~wherein the ~~prior means to~~ demodulator determines the log likelihood ratio (LLR) ~~use~~ using a criterion belonging to the group comprising:

- ~~the~~ a Lop-Map criterion;
 - ~~the~~ a Max-Log-Map criterion;
 - ~~the~~ a SOVA (Soft-Output Viterbi Algorithm based on the maximum likelihood criterion for detection of the most probable sequence);
- and / or approximation of one of these criteria.

22. (Currently Amended) Receiver set forth in ~~any of claims 17 and 18, characterised in that~~claim 17, wherein the main and / or secondary confidence bit associated with a bit is a log likelihood ratio (LLR) of said bit, called ~~the~~ a main and / or secondary soft bit, and ~~in that said means to demodulator, which~~ determines said secondary confidence bit comprises additional ~~means~~ outputs:

- to express the secondary "soft bits" as a function of a posteriori probabilities of symbols in said secondary constellation, said symbols in said secondary constellation also belonging to said main constellation, so as to obtain a first expression;

- to express a posteriori probabilities of bits in said main constellation as a function of the a posteriori probabilities of symbols in said main constellation, bringing out the soft bits in said main constellation, output during said demodulation step of said main signal so as to obtain a second expression.

23. (Currently Amended) Receiver set forth in claim 17, ~~characterised in that~~wherein said element is a symbol in said main and / or secondary constellation.

24. (Currently Amended) Receiver set forth in claim 23, ~~characterised in that~~wherein said main and / or secondary confidence bit associated with a symbol ~~is~~ comprises an a posteriori probability of a symbol in said main and / or secondary constellation, and in that said ~~means for demodulating~~ demodulator, which demodulates said main signal uses one of the detection algorithms belonging to the group comprising to calculate said main confidence bits:

- ~~the~~ a Max-Log-Map;
 - ~~the~~ a Log-Map;
 - SOVA (Soft-Output Viterbi Algorithm based on the maximum likelihood criterion for detection of a most probable sequence);
 - DDFSE (Delayed Decision Feedback Sequence Estimation);
 - RSSE (Reduced-State Sequence Estimation);
 - M-algorithm;
 - T-algorithm;
- to calculate said main confidence bits.

25. (Currently Amended) Receiver as set forth in ~~any of claims 17 to 24, characterised in that~~claim 17, wherein said main and / or secondary constellations belong the group comprising:

- M-QAM modulations, where $M = 2m$;
- N-PSK modulations, where $N = 2n$;
- ~~the~~ a linearised GMSK or MSK modulation.